

## **BRIDGE HYDRAULIC SERVICES**

PROJECT NAME: **SCRIBNER TO WEST POINT**

PROJECT NO.:

CONTROL NO.:

### **A. HYDRAULIC BRIDGE DESIGN**

Qualifications and experience in technical services will include hydraulic surveying, hydrologic and hydraulic bridge design, floodplain certifications, Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR), levee certification (408 permit) and type, size and location (TS&L) sheet. This project includes the bridges:

- S275 13258
- S275 12888
- S275 12670
- S275 12627
- S275 12587
- S275 12547
- S275 12018
- S275 11799

#### **1. STATE TO**

- a. Provide as-built plans of existing structures.
- b. Provide the latest copy of “NDOR Hydraulic Analysis Guidelines and Hydraulic Forms” (<http://www.transportation.nebraska.gov/design/bridge/hyd.htm>).
- c. Provide the latest copy of the “NDOR Bridge Office Policies and Procedures Manual” (BOPP Manual) (<http://www.transportation.nebraska.gov/design/bridge/downloads-manuals.html>).

#### **2. APPLICABLE PUBLICATIONS**

The Consultant shall follow the criteria of the current applicable publications of the American Association of State Highway and Transportation Officials and design criteria furnished by the State. These publications and others which the Consultant shall use in this work are:

- a. NDOR Hydraulic Analysis Guidelines and Hydraulic Forms (<http://www.transportation.nebraska.gov/design/bridge/hyd.htm>).
- b. NDOR Bridge Office Policies and Procedures Manual (BOPP) (<http://www.transportation.nebraska.gov/design/bridge/downloads-manuals.html>).
- c. Provide MicroStation bridge design files, including base sheets, current design standards, libraries, etc. (Available on NDOR web site)
- d. AASHTO LRFD Bridge Design Specifications (Sixth Edition)
- e. Nebraska Minimum Design Standards, Board of Public Roads Classifications and Standards 2008 (or latest edition) (<http://www.transportation.nebraska.gov/gov-aff/pdfs-docs/manuals/proc-class-stan-min-des.pdf>).

- f. Nebraska Department of Roads Standard Specifications for Highway Construction, 2007 (or latest edition) (<http://www.transportation.nebraska.gov/ref-man/specbook-2007.pdf>).
- g. Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), Flood Hazard Boundary Maps (FHBM) and Flood Insurance Studies (FIS).
- h. Federal-Aid Policy Guide, 23 CFR 650A, Location and Hydraulic Design of Encroachments on Flood Plains.
- i. Federal Highway Administration Publication No. FHWA-HIF-12-026, Hydraulic Design Series No. 5, Hydraulic Design of Highway Culverts, Third Edition.
- j. Federal Highway Administration Publication No. FHWA-HIF-12-003, Hydraulic Engineering Circular No. 18, Evaluating Scour at Bridges, Fifth Edition.
- k. Federal Highway Administration Publication No. FHWA-NHI-10-009, Hydraulic Engineering Circular No. 22, Urban Drainage Design Manual, Third Edition.
- l. Federal Highway Administration, Hydraulics Regulations and Non-regulatory supplements (<http://www.fhwa.dot.gov/engineering/hydraulics/policymemos.cfm>).

### 3. FIELD INSPECTIONS AND MEETINGS

- a. General project management:
  - 1) This task includes effort for coordination of staff, coordination with NDOR, progress reports, invoices and overall project management.

- b. The Consultant shall arrange field visits as follows:

<u>Type</u>	<u>Date/Time</u>	<u>Location</u>
Field visits (2 staff, 1 day)	TBD	field site

- c. The Consultant shall arrange meetings as follows:

<u>Type</u>	<u>Date/Time</u>	<u>Location</u>
Hydraulic Results Review	TBD	NDOR

- d. Within three working days after the close of each meeting, the Consultant shall prepare and submit to the State one copy of a report summarizing the discussions, decisions, and agreements reached.

### 4. HYDRAULIC ANALYSIS

- a. The Consultant shall layout and complete the hydraulic survey necessary to perform the hydraulic analysis.
- b. The Consultant shall review the FEMA requirements.
- c. The Consultant shall complete the hydrology based on the above mentioned guidelines.
- d. The Consultant shall coordinate with NDOR Roadway Design Division on any roadway related items.
- e. The Consultant shall complete the existing condition analyses of the bridge sites to determine current conditions.

- f. The Consultant shall complete the proposed and alternate condition analyses for comparison for each site.
- g. The Consultant shall perform scour analysis on the existing conditions to determine the stability of the structure.
- h. The Consultant shall perform an economic evaluation of the proposed and alternate condition to determine the most practical design.
- i. The Consultant shall perform a risk assessment on the proposed and alternate conditions to determine the most practical design.
- j. The Consultant shall determine if a CLOMR/LOMR is needed for this project. If it is needed, then a supplemental agreement will be established.
- k. The Consultant shall produce one foot contour plots at each bridge site.
- l. The Consultant shall complete a floodplain certification of compliance form for each bridge site.
- m. The Consultant shall certify any work that is adjacent to a certified levee. This includes the 408 permit.
- n. The Consultant shall prepare a hydraulic report containing information for all the bridge size structures.
- o. The Consultant shall produce a hydraulic data sheet for all structure sites.
- p. The Consultant shall produce a TS&L sheet for each bridge sized structure.

5. ESTIMATED TIMELINE

- a. TBD, Notice to proceed
- b. TBD, Submit draft hydraulic analysis for review
- c. TBD, State to complete review of hydraulic analysis
- d. TBD, Submit completed hydraulic analysis and final report